in dysperistalsis (colic), it is an algio-motor reflex—psychically higher. Again the unconscious micturition in a sleeping child is excito-muscular, whereas healthy adult micturition is sensori-muscular, consciousness being affected, and the reflex (within limits) being capable of voluntary control—physiologically they are quite similar so far as the mechanism of the act is concerned. Intermediate in psychical value between mere stimulations and the sensori-motor group are the algio-motor reflexes, for which consciousness at least of pain is a *sine quâ non.*

Under group 3, the sensori-motor, are included all those reflexes whose afferent currents have originated in a true *sense*-organ, there having existed a perception (to be strictly accurate) between the reception of the afferent current and the emission of the efferent. Now this, like most *natural* groups, has no rigid confines, for, in the first place, if the sensation be painful, the pain may be *the* predominating mental state, and the subsequent reflex be an algio-motor; while, on the higher side, it merges into group 4 or 5, both emotions and ideas being pre-eminently stirred up by sensations *pre*sented (*re*-presented sensations being " ideas " themselves).

But when an emotion (however produced) is the *characteristic* of the mental state *causally* preceding a reflex, that reflex is emotio-motor, the emotion being *the* intermediary between the afferent and the efferent currents. Almost no state is purely perceptive, emotional or ideational, yet it may be one of these *characteristically*, and *as such* gives rise to *its* reflex.

The ideo-motor group includes all reflexes which are not the result of either perception or emotion; in some sense " residual phenomena " among reflexes.

The " ideas " may, of course, be perceptions or emotions *re*presented.

It would be under the heading " ideo-muscular " that one would classify " volitions " if disposed to do so—a proceeding very acceptable to certain advanced psychological physiologists. And yet, to call all voluntary acts reflex, seems to lose sight of certain most radical distinctions between sets of actions, most notably between a reflex act (as we all understand it), and what one might call the corresponding voluntary *imitation* of it, *e.g.*, winking from a strong light is a sensori-muscular reflex; winking *voluntarily* is *psychologically* a process of a totally different kind.

The notion of a "reflex," as a thing done in "spite of a person," vanishes. Again, laughing "in spite of yourself," is an emotio-muscular reflex (afferent currents being from ear or eye or both), whereas voluntary laughing, *i.e.*, imitation of laughing, is, on the face of it, a very different act. Of course, many reflexes can be controlled by the will, but to identify an action which is habitually uncontrolled by the will with one which must be both originated and controlled by the will seems confusing.

The will naturally suggests "reflex inhibition." This is largely, but by no means entirely, voluntary.

I suggest that a reflex action (as ordinarily understood) be designated + (positive), and that when "inhibited" or prevented from taking place (either by the restraining influence of a higher centre upon the special "reflex" centre in question, or by the advent of an impulse to the lower centre which prevents that discharge) it be called a negative (—) reflex. Under this last category might be included reflex inhibitions of acts other than reflex themselves.

Thus the will notoriously both inhibits reflexes (as in the postponement of adult defæcation) and reflexly inhibits; but a powerful "idea" can as efficiently reflexly inhibit, as when a sudden thought renders a person speechless for the time being (*negative* ideo-muscular reflex).

It is almost superfluous to add that an emotion can inhibit reflex action, as when "fear" causes dry mouth (*negative* emotio-glandular reflex), or when "joy" produces syncope (in this case a term is already in use—cardio-inhibitory reflex).

Lastly, pain can reflexly inhibit, as in syncope from "shock" from operation (negative algio-muscular reflex on cardiac muscle).

As to "vaso-motor" reflexes, if there be but *one* centre "vaso-motor," whose function it is to maintain general

vascular tonus, then active (arterial) hyperæmia, due to inhibition of the centre, would be a negative excito-vascular reflex ("vaso-inhibitory" of authors), while pallor would be the positive excito-vascular reflex ("vaso-constrictor"). If there be *two* centres, one for vaso-constriction, Vc., and one for vaso-dilatation, Vd., then, *e.g.*, blushing from present emotion would be either: ~~λ~~ + emotio-vascular reflex through d
d Vd., or ~~λ~~ — emotio-vascular reflex through Vc.; and similarly, emotional blanching would be either: ~~λ~~ + emotio- d
vascular reflex through Vc., or ~~λ~~ — emotio-vascular reflex d
through Vd.

A word as to psychico-metabolic reflexes. Of course, all vital action is "metabolic," but one can distinguish a kind of reflex concerned, not with definite glands or vessels, but having its manifestations through a wide spatial distribution.

We may, as before, have metabolism stimulated or depressed, and thus a + psychico-metabolic reflex might be more shortly named psychico-anabolic, while a — psychico-metabolic reflex would be a psychico-katabolic reflex.

Thus, the hair turning white through emotion would be a negative emotio-metabolic reflex.

The emotional state has acted "*reflexly*" on centres trophic to the nerves influencing the formation of pigment over a considerable area of skin.

It would be under the category "*ideo*-metabolic" that we would place those well-authenticated cases of hallucinations causing or curing disease. Thus there is much mystery and romance dispelled when instead of "miraculous cure by faith-healing" we write "positive ideo-metabolic (systemic) reflex!" Of course, metabolic reflexes might exist in other systems than the dermal.

A final word on reflexes. It will be very evident that "expression of the emotions" is largely reflex, while any imitation of an emotion—simulation of a particular expression—is a different thing psychologically; it is voluntary to begin with. Moreover, expression of many emotions is eminently under control: self-command does not so much consist in not experiencing certain emotions, as in being habitually able to "inhibit" or control their manifestations.

A CLASSIFICATION OF REFLEX ACTIONS ON A PSYCHICO-PHYSIOLOGICAL BASIS.

A	B	C	D	EXAMPLES.
I. PERIPHERO-MOTOR.	1. *Excito-motor.*	Excito-muscular	Of Involuntary muscle.	Euperistalsis. Micturition in sleeping child. Early non-voluntary stages of Parturition. Defæcation and micturition in "spinal disease" and in coma. Iris reflex in partial narcosis. Hiccough. Ejaculatio seminis during sleep. Later stages of deglutition.
			Of Voluntary muscle.	Spasm in children during sleep from any irritation, *e.g.*, worms. Movements of unconscious adjustment in sleep.
		Excito-glandular.		Outpouring of gastric and intestinal juices in digestion. "Sympathetic" preparation of the mammary glands in pregnancy.
		Excito-vascular.		Pathological blushing ("flushings") from indigestion. Erectio penis (in sleep). Probably certain tropho-neuroses, such as erythema, eczema, herpes, scleroderma, urticaria, "glossy skin."
		Excito-metabolic (Dermal).		Pigmentation of areola in pregnancy. Chloasma in disease.
	2. *Algio-motor.*	Algio-muscular.		Of *Involuntary* muscle: Dysperistalsis (colic). Vomiting from "renal colic," &c. Inhibition of heart ("shock") under operation without chloroform. Of *Voluntary muscle*: Spasm=writhing from pain.
		,, glandular.		Perspiration due to pain. Lachrymation from painful foreign body.
		,, vascular.		Blushing or pallor from agony.
		,, metabolic.		
	3. *Sensori-motor.*	Sensori-muscular	Of Involuntary muscle.	Contraction of iris in strong light. Action of tensor choroideæ in positive accommodation. Contraction of uterus when child is "put to the breast." Non-voluntary elements of adult, conscious micturition and defæcation.
			Of Voluntary muscle.	Coughing, sneezing. Winking from foreign body. Laughter and spasm from tickling. Spasm from draught of cold air in hydrophobia. Deep inspiration from cold affusion.
		Sensori-glandular.		Lachrymation in strong light. Salivation on eating sour or acid materials, or at sight of food.
		,, vascular.		Pallor in cold bath. Glow of skin in hot bath. Catarrh of mucous membranes (*e.g.*, nasal) from draught of air, &c.; probably with contemporaneous "low nerve tone." Rise of blood-pressure whilst hearing music.
		,, metabolic (dermal).		Freckles. "Bronzing" of skin in hot climates.

II. CENTRO-MOTOR.	4. *Emotio-motor.*	Emotio-muscular.	Of Involuntary muscle.	Hyper-peristalsis with diarrhœa from various emotions, *e.g.*, fear. Progress of "labour" (dilatation of "os") inhibited by stranger coming in, or induced by fright. Cardio-inhibition ("syncope") from many emotions—"Heart standing still." Rate of heart beat accelerated by emotion. Micturition through emotion.
			Of Voluntary muscle.	Child jumping for joy, stamping feet from vexation, slamming door from rage. Assault and murder from violent emotion. Emotional alteration of the respiratory rhythm, *e.g.*, sighing.
		Emotio-glandular.		Activity of certain glands, *e.g.*, stink-glands of "skunk" through fear. Weeping from emotion or inability to do so. Inhibition of salivation from fear. "Cold sweat" of fear, and perspiration from other emotions. Lactation ("draught of milk") induced through joy. Eupepsia due to happy "frame of mind."
		Emotio-vascular.		Blushing from shame, modesty, rage, &c. Pallor from rage, fear, "nervousness," &c.
		Emotio-metabolic (dermal).		Hair turning grey from emotion.
	5. *Ideo-motor.*	Ideo-muscular.	Of Involuntary muscle.	Vomiting from *recollection* of disgusting sight or taste, or from vivid gustatory hallucination. Influence of hallucinations, &c., in the insane on the muscular tonus of viscera, *e.g.*, constipation of certain lunatics. Spasm of muscles of deglutition in hydrophobia at the *idea* of "water."
			Of Voluntary muscle.	Actions and co-ordinated movements in somnambulism, and the majority of such in the hypnotic trance. Laughing at a recollection. "Reflex speech" of certain lunatics. Certain so-called "secondarily automatic" actions, such as standing, sitting, walking, playing on piano (when completely familiar with it).
		Ideo-glandular.		Weeping at a recollection. Action of hallucinations (in the insane) on secretions. Salivation at thought of food.
		Ideo-vascular.		Blushing or blanching at a recollection.
		Ideo-metabolic.		Nails ceasing to grow in mania (dermal). Action of the mind over nourishment of tissue. Mentally-induced or cured diseases (as alleged). Psychically-produced tropho-neuroses.

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